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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/852,899	05/10/2001	Alvin P. Short	01 P 08366 US (8055-25)	5432

7590 03/10/2003

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EXAMINER

MAI, ANH D

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 03/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/852,899

Applicant(s)

SHORT, ALVIN P.

Examiner

Anh D. Mai

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 February 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 10, 2003 has been entered.

Amendment

2. Amendment filed February 10, 2003 has been entered as Paper No. 10. Claims 1 have been amended. Claims 1-6 are pending.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1 and 4 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Bronner et al. (U.S. Patent No. 6,177,696).

Bronner teaches a semiconductor device as claimed including:

a trench (1) formed in a substrate (100):

Art Unit: 2814

a diffusion region surrounding the trench to form a buried plate (14);
a first conductive material (18) formed in the trench (1) wherein the first conductive material (18) makes contact to the buried plate (14) to form first electrode (18), the contact being made along an entire bottom portion of the trench (1) and along a lower portion of the side walls of the trench;

a second conductive material disposed in the trench (1) to form a second electrode (32);
and

a node dielectric layer (30) formed between the first electrode (14/18) and the second electrode (32). (See Fig. 17).

With respect to claim 4, the first conductive material (18) of Bronner includes one of the material as claimed.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 2, 3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bronner '696 as applied to claim 1 above, and further in view of Park (U.S. Patent No. 5,677,225) (cited previously).

With respect to claim 2, Bronner teaches a first conductive material (18) contacting the buried plate (14) at the bottom and along the lower sidewalls portion of the trench (1).

Art Unit: 2814

Thus, Bronner is shown to teach all the features of the claim with the exception of the first conductive material is formed into a plurality of the pillars.

However, Park teaches the first conductive material (26') is formed into a plurality of pillars extending from the bottom of the trench. (See Fig. 2D).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to form the first conductive material of Bronner into a plurality of pillars as taught by Park to further increase capacitance in a small area. (See col. 2, lines 19-22).

With respect to claim 3, in view of Park, the plurality of pillars includes the second conductive material (33) disposed between the plurality of pillars.

With respect to claim 6, in view of Park, the second conductive material (33) disposed between the first conductive material (26') and the buried plate (23).

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bronner '696 as applied to claim 1 above, and further in view of Chang (U.S. Patent No. 6,077,739) (cited previously).

Bronner teach a semiconductor device includes a doped second conductive material (32).

Thus, Bronner is shown to teach all the features of the claim with the exception of explicitly using doped amorphous silicon.

However, Chang teaches that doped amorphous silicon (32) can also be used for the second conductive material.

Art Unit: 2814

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to form the second conductive material (32) of Bronner using doped amorphous silicon as taught by Chang since amorphous can be deposited at a lower temperature than Polysilicon, thus, damage to the existing components are avoided. (This is well known in the art).

Response to Arguments

6. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

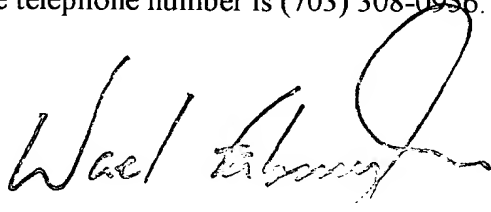
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anh D. Mai whose telephone number is (703) 305-0575. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703) 308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

A.M
March 5, 2003


SUPERVISORY PRIMARY EXAMINER
TECHNOLOGY CENTER 2000